Chroma-Q™

Color Force™ 48 / 72

User Manual

Chroma-Q™
BRILLIANT SOLUTIONS

Version 1.6 March 2013, Software Version 2.1
PN: 622-0500

Warranty Statement

Chroma-Q warrants to the original purchaser, with proof of purchase, that its delivered products shall be free from defects in material and workmanship under normal use for a period of 12 months from date of shipment.

Chroma-Q will repair, or at its option, provide an equivalent item or replace, the defective product during the stated warranty period. This warranty applies only to the repair or replacement of the product and only when the product is properly handled, installed and maintained according to Chroma-Q instructions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. Purchaser must notify Chroma-Q in writing within 14 days of noticing the defect. This warranty excludes field labour or service charges related to the repair or replacement of the product.

The warranty contained herein shall not extend to any finished goods or spare parts from which any serial number has been removed or which have been damaged or rendered defective (a) as a result of normal wear and tear, willful or accidental damage, negligence, misuse or abuse; (b) due to water or moisture, lightning, windstorm, abnormal voltage, harmonic distortion, dust, dirt, corrosion or other external causes; (c) by operation outside the specifications contained in the user documentation; (d) by the use of spare parts not manufactured or sold by Chroma-Q or by the connection or integration of other equipment or software not approved by Chroma-Q unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (e) by modification, repair or service by anyone other than Chroma-Q, who has not applied for and been approved by Chroma-Q to do such modification, repair or service unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (f) due to procedures, deviating from procedures specified by Chroma-Q or (g) due to failure to store, install, test, commission, maintain, operate or use finished goods and spare parts in a safe and reasonable manner and in accordance with Chroma-Q's instructions (h) by repair or replacement of engines without factory training.

The warranty contained herein shall not apply to finished goods or spare parts which are sold "as is", as "second-hand", as used", as "demo" or under similar qualifications or to Consumables ("Consumables" is defined as any part(s) of goods or part(s) for use with goods, which part(s) of goods or part(s) for use with goods are consumed during the operation of the goods and which part(s) of goods or part(s) for use with goods require replacement from time to time by a user such as, but not limited to, light bulbs).

The warranty contained herein shall not apply, unless the total purchase price for the defective finished goods or spare parts has been paid by the due date for payment.

The warranty contained herein applies only to the original purchaser and are not assignable or transferable to any subsequent purchaser or end-user.

This warranty is subject to the shipment of the goods, within the warranty period, to the ChromaQ warranty returns department, by the purchaser, at the purchasers expense. If no fault is found, ChromaQ will charge the purchaser for the subsequent return of the goods.

Chroma-Q reserves the right to change the warranty period without prior notice and without incurring obligation and expressly disclaims all warranties not stated in this limited warranty.

Disclaimer

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Chroma-Q products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent. Chroma-Q sole warranty is that the product will meet the sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

Chroma-Q reserves the right to change or make alteration to devices and their functionality without notice due to our on going research and development.

The Chroma-Q Color Force has been designed specifically for the lighting industry. Regular maintenance should be performed to ensure that the products perform well in the entertainment environment.

If you experience any difficulties with any Chroma-Q products please contact your selling dealer. If your selling dealer is unable to help please contact support@chroma-q.com. If the selling dealer is unable to satisfy your servicing needs, please contact the following, for full factory service:

Outside North America:
Tel: +44 (0)1494 446000
Fax: +44 (0)1494 461024
support@chroma-q.com

North America:
Tel: 416-255-9494
Fax: 416-255-3514
support@chroma-q.com

For further information please visit the Chroma-Q website at www.chroma-q.com.

Chroma-Q and Color Force are trademarks, for more information on this visit www.chroma-q.com/trademarks.

The rights and ownership of all trademarks are recognised.

Important Notice:
As per the requirements in the Occupational Safety and Health Administration standards for product approval, please refer to the OSHA web pages http://www.osha.gov/dts/otpca/nrtl/ for information on the list of Nationally Recognized Testing Laboratories (NRTLs) and the scope of recognition.

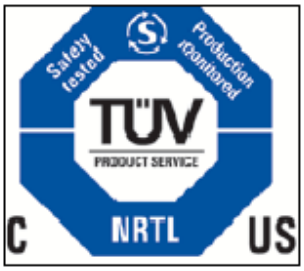


Table of Contents

1. **Product overview** 4
2. **Operation** 4
   - 2.1 Unpacking the units 4
   - 2.2 Cabling 5
   - 2.3 Mounting 5
   - 2.4 Orientation 5
   - 2.5 Cyc & Border Lens 6
   - 2.6 Control 6
   - 2.7 DMX Protocol 10
   - 2.8 Thermal Performance 14
3. **Troubleshooting** 14
4. **Specification** 15
   - 4.1 Technical specifications 15
   - 4.2 Illuminance measurements 16
   - 4.3 Drawings 17
5. **Maintenance** 18

1. Product overview

The Chroma-Q Color Force LED batten range is a brute of a light. At up to 12,000 hot lumens output (Color Force 72); the super bright fixture easily washes up to 8m / 26 foot. In addition, the advanced colour mixing and control management technologies together give you a radically increased colour palette, a high CRI of 92 and theatrical grade dimming, all in the same fixture.

Slide-in "Cyc Light" and "Border Light" optical accessories are available to adjust the light output to suit a wide range of applications.

The Chroma-Q Color Force lighting fixture is designed specifically for professional indoor entertainment lighting. The fixture can be wall or floor mounted with the adjustable quick-release end-plate fixing system. For hung bar or truss mounting, additional bar clamp hardware is required.

The Color Force features built-in power supplies and can operate as a stand-alone unit or be remotely controlled through ANSI E1.11 USITT DMX 512-A protocol.

The Color Force is available in two lengths, the Color Force 72 model which features a total of 288 high powered LEDs (12 x 1000 lumen RGBA cells) and the Color Force 48 model which features a total of 192 high powered LED's (8 x 1000 lumen RGBA cells).

The control options incorporate a choice of HSI (Hue, Saturation and Intensity), RGBA (Red, Green, Blue, Amber), RGB (Red, Green, Blue, with *Magic Amber), RGBI (Red, Green, Blue with *Magic Amber and Intensity) control modes. The Color Force also features a dynamic Variable Effects Engine integrated in the software, which gives the lighting designer full control over colour and effects combinations.

The product's robust anodised aluminum extruded construction houses a discreet cable management system. Additional protection is built around the lenses for a truly road proof fixture.

2. Operation

2.1 Unpacking the units

The Color Force package includes 1 unit Color Force fixture, power connector (EU)/power cord (US) and a Quick Start Guide. We recommend that you keep the original packaging in case the item needs to be returned.

2.2 Cabling

The Color Force utilises PowerCon connectors for power input and through. The DMX control data input and through connections from an external control console are via two XLR 5-pin connectors. The chassis are ground bonded.

Note: To avoid overloading the input cable, the maximum length of Color Force fixtures for a single power cable run is 3.6m (12') at 110V or 7.2m (24') at 220V.

XLR 5-pin Cable:

Pin#	Function
1	Ground (Screen)
2	Data Minus
3	Data Plus
4	Spare Data Minus
5	Spare Data Plus

Power Cable:

International Colour Code	North American Colour Code	Connections	
Green and Yellow	Green	Earth (E)	Ground (Green)
Blue	White	Neutral (N)	Neutral (Silver)
Brown	Black	Live (L)	Hot (Gold)

Important Notice:
The use of an opto-splitter for DMX signal distribution is highly recommended when several fixture units are not plugged into the same power source.

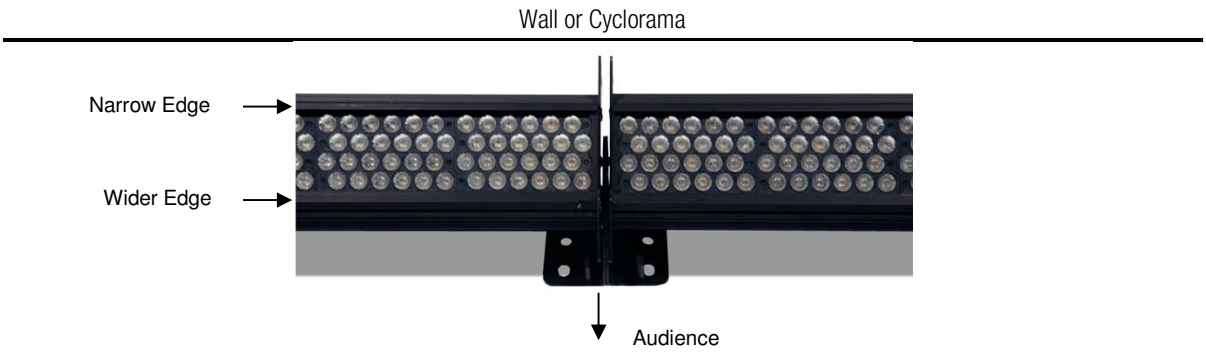
2.3 Mounting

The Color Force 48 & 72 fixtures are equipped with built-in mounting brackets for floor, wall and truss mounting applications. The mounting brackets feature a pair of quick release levers for easy tilt adjustment.

Note: Secure the fixture with a safety bond. Provision for a fixing hold is built into the brackets.

2.4 Orientation

The Color Force 48 & 72 fixtures are built with near/far lenses that optimize the beam spread when used on a wall or cyclorama. The side with near-field lenses is indicated by the narrow edge border, which should be adjacent to the wall or cyclorama. The side with far-field lenses is indicated by the wider edge border, which should be facing away from the wall or cyclorama.



2.5 Cyc & Border Lens

"Cyc Lens" and "Border Lens" are slide-in optical accessories available to adjust the light output of the Color Force 72 & 48 fixtures to suit a wide range of applications. Two accessory slots are available at the front of the fixture to hold these slide-in Lens. Matching indentations on both ends of both panels are available for locking.

Spring Plungers are pre-installed at the far ends of both accessory slots to lock in-place the slide-in panels. The height of the spring plungers are preset and fixed with no need for further adjustment.

2.6 Control

Color Force 48 & 72 fixture can operate as a stand-alone unit or be controlled remotely via ANSI E1.11 USITT DMX 512-A protocol. The control functions can be accessed through the LCD display at the rear of the fixture with 4 push buttons.

Push button operation:

Control	Function
Exit	Back to previous menu
Up Arrow	Increases (+) the mode level or value
Down Arrow	Decreases (-) the mode level or value
Back Arrow	(Enter) Stores the menu choice

Power-Up Display:
On power-up and home position, the display shows the model name, software version, the DMX address, current assigned mode and the number of assigned channels.

Display Mode:
The LCD is backlit when you access the menus. This will turn off when left undisturbed for 5 seconds.

Control Options:
3 channel HSI (Hue, Saturation and Intensity) gives 2 colour channels for hue and saturation and a separate intensity channel. A separate definable intensity channel is particularly useful when creating intensity chases or when the grand master is used. The hue channel has 255 different colours available and the saturation channel specifies the saturation level of that colour. The saturation channel is fully saturated at full. White is achieved with the intensity channel to full and the saturation channel at zero.

3 channel RGB (Red, Green, Blue with *Magic Amber™) is the more traditional way of controlling colour changing LED fixtures. Each of the three control channels directly affects the intensity of the corresponding LED. Colour is mixed by adjusting the levels of the three primary colours. White is achieved with all channels at full including Magic Amber.

4 channel RGBA (Red, Green, Blue and Amber) gives 4 control channels directly affecting the intensity of the corresponding LED – Red, Green, Blue and Amber. Colour is mixed by adjusting the levels of each of the four colours. White is achieved with all channels at full.

3 channel HSI (Hue, Saturation and Intensity) + **7 effects channels** gives 2 colour channels for hue and saturation, separate intensity channel and 7 channels for effects (Grouping, Colour Speed, Fan, Range, Step, Intensity Effects, Intensity Fan).

3 channel HSI + 6 effects channels gives 2 colour channels for hue and saturation, separate intensity channel and 6 effects (Colour Speed, Fan, Range, Step, Intensity Effects, Intensity Fan).

3 channel RGB (with *Magic Amber) + **1 intensity channel + 1 effects channel** gives three control channels directly affecting the intensity of the corresponding LED – Red, Green, Blue with *Magic Amber, 1 channel affecting the intensity of all RGB(A) channels, and 1 channel for intensity effect.

Grouping options: grouping by individual "cell" and "all" cells. A Color Force 72" fixture consists of 12 cells and a Color Force 48" fixture consists of 8 cells. "Cell" grouping allows individual control of each single cell. In "All" grouping, all cells in either the 72" or 48" fixture can be controlled as 1 group.

Internal FX engine: mode 1, 5, 6 and 10 incorporate internal FX engine with variable parameters to create an unlimited amount of unique lighting effects. (see 2.5 DMX Protocol for list of parameters) All internal FX are referenced back to the group base HSI colour and intensity levels.

*Magic Amber is the term used for the unit's ability to bring in amber when mixing colours that require it.

Control Menu

Use the push buttons (up/down arrows) to scroll through the control menu positions:

→ **Home / DMX Address**

To set the DMX start address, press Enter, press Up/Down buttons to adjust DMX start address, press Enter for 2 seconds to save the settings.

→ **Control Mode**

The Color Force can be set to operate in 11 DMX controlled modes. 2 grouping options are available (cell-grouped, all-grouped) with 5 control options: fxHSI, HSI, RGB (with Magic Amber), RGBA, RGBI (with Magic Amber), pre-programmed looks and stand-alone effects. Refer to the list below for details.

Press Up/Down buttons to access the "Control Mode", press Up/Down to select the mode and press Enter for 2 seconds to save the settings.

Color Force 72

Mode	Group	Ch	Description
1	Variable	43	7fx + 12 x HSI -or- 7fx + 12 x RGB(A) with Ch5 @ Full & Ch2 as Intensity Master
2	Cell	36	12 x HSI
3	Cell	36	12 x RGB (with *Magic Amber)
4	Cell	48	12 x RGBA
5	Cell	49	1s + 12 x RGBI (*Magic Amber)
6	All	9	6fx + HSI -or- 6fx + RGB(A) with Ch4 @ Full & Ch1 as Intensity Master
7	All	3	1 x HSI
8	All	3	1 x RGB (with *Magic Amber)
9	All	4	1 x RGBA
10	All	5	1s + RGBI (with *Magic Amber)
11		1	Look Select
12			Master stand-alone
13			Slave stand-alone

Color Force 48

Mode	Group	Ch	Description
1	Variable	31	7fx + 8 x HSI -or- 7fx + 8 x RGB(A) with Ch5 @ Full & Ch2 as Intensity Master
2	Cell	24	8 x HSI
3	Cell	24	8 x RGB (with *Magic Amber)
4	Cell	32	8 x RGBA
5	Cell	33	1s + 8 x RGBI (with *Magic Amber)
6	All	9	6fx + HSI -or- 6fx + RGB(A) with Ch4 @ Full & Ch1 as Intensity Master
7	All	3	1 x HSI
8	All	3	1 x RGB (with *Magic Amber)
9	All	4	1 x RGBA
10	All	5	1s + RGBI (with *Magic Amber)
11		1	Look Select
12			Master stand-alone
13			Slave stand-alone

When DMX is Lost

If DMX is not detected various output options can be selected:
Press Up/Down to access “When DMX is Lost”, press Enter, press Up/Down buttons to select the setting , press Enter for 2 seconds to save.
‘Off’ - will snap to off
‘Hold’ - will hold the last valid DMX state
Look 1-31 will snap to the Look of your choice

Look Store

The Color Force has 31 internal preset FX Looks for stand-alone operation, 1-23 are pre-programmed.

To replay a Look in stand-alone operation, press Up/Down buttons to access “Look Store”, press Enter, press Up/Down buttons to select the desired Look and press Enter for 2 seconds to save settings.

To replay a Look with a DMX console, press Up/Down buttons to access Control Mode 11 and press Enter for 2 seconds. Use the DMX console with the assigned channel to playback the various looks stored. (1-31 looks in 1 single channel)

Note: DMX has priority over internal Looks.

Looks can be recorded to the internal flash memory by users and will be preserved on power down. However, looks will be returned to default setting if Reset is performed. There are two ways to record a look:

Simple, with DMX console:

Set the Color Force to the desired Control Mode. Use a DMX console to adjust channel levels and create the desired look or effect. Press Up/Down buttons to “Look Store” and press Enter, press Up/Down buttons to the desired Look number and press Enter. Press Enter again for 2 seconds to save Look.

Advanced, stand-alone: (DMX is unplugged)

Press Up/Down buttons to access “Look Store”, and press Enter, press Up/Down button to the desired Look and press Enter to access the memory data. The data is presented as two numbers separated by a letter “c”. The number to the left of the “c” is the channel number and to the right is the channel level. Pressing Up/Down up to the far end will show the Mode at which the selected Look was programmed.

To edit the Mode of a selected Look:

Press Up/Down buttons to access “Look Store” and press Enter, press Up/Down to the desired Look and press Enter to access the memory data. Press Up/Down buttons up to the far end until Mode number is shown and press Enter. Press Up/Down buttons to adjust the Mode number. Press Enter to toggle back to the channel numbers.

To edit the channel numbers and levels of a selected Look:

Press Up/Down buttons to access “Look Store” and press Enter, press Up/Down to the desired Look and press Enter to access the memory data. Press Up/Down buttons and select the channel number. To edit the channel level, press Enter and use the Up/Down buttons to adjust the level (shown as 0-255). Press Enter to toggle back to the channel number. When the desired effect is created press Enter for 2 seconds to save the edited Look.

→ Technical

In this mode, frequency settings of the unit can be changed and addressing software for LED engines can be uploaded.

Press Up/Down to access “Technical”, press Up/Down to select either “Frequency” or “Upload Engines”.

Frequency:

The Color Force has four frequency settings available - 600, 1200, 2400 and 4800. This allows for the LED scan rate to be synchronised with the video camera and avoid a flickering effect. Press Up/Down buttons to select the desired frequency, press Enter for 2 seconds to save settings.

Upload Engines:

Addressing software for LED engines can be uploaded to the Color Force from the Chroma-Q Uploader.

1. Press Enter, Up/Down buttons to select “Upload Engines” then press Enter, and the display will show “Ready”:
2. Connect an XLR 5-pin cable from the Uploader to the unit.
3. Power-up the Uploader - display will show the file name, and ‘Ready’.
4. Press the “GO” button once to execute the uploading - red indicator light on the “GO” button will blink.
5. The Uploader display will show a simulated arrow moving from left to right indicating the uploading process.
6. All the green LEDs of the unit will light up (low intensity) to indicate completion of a successful Upload and the Uploader display will show “DONE”.
7. Power-cycle the unit.

(See Quick Start Guide of the Chroma-Q Uploader)

→ Fan Speed

The Color Force is built with internal fans with 3 speed settings – “Quiet”, “Studio”, and “Live”. In “Quiet” mode the internal fan is off and light output is reduced by 45%. In “Studio” mode the fan speed is at low velocity and light output is reduced by 15%. In “Live” mode the fan speed at the level of the previous “Version 1.9” at high velocity and the light output at 100%.

Press Enter, Up/Down buttons to select “Fan Speed”, then press Enter to select from either “Quiet”, “Studio”, “Live” or “Live with Light”, and then press Enter for 2 seconds to save the settings.

→ Reset to Default

Press Up/Down to access “Reset to Default”, press Enter and the display will show “reset?”, press Enter for 2 seconds until the display shows “resetting”, and wait for the display to show “done” and reset is complete with all menu items reset to factory defaults: DMX address = 001, Control Mode = 1 , DMX Lost = Hold, Looks = 00, Fan speed = Live, Frequency = 600, Display = On,

2.7 DMX Protocol

Color Force DMX Personality Mode 1:

Color Force V2.1	In mode 1 grouping is variable.	
	Mode 1	
	Color Force 72 (43ch) 7fx + 12 x HSI	Color Force 48 (31ch) 7fx + 8 x HSI
Channel 1	Grouping 0-100 Variable grouping range between 1-12 cells with FX running within the group. 102-206 Variable grouping range between 1-12 cells with FX running between the groups. 209-255 Variable interval grouping range for every 2nd to every 12th cells in a group.	Grouping 0-100 Variable grouping range between 1-8 cells with FX running within the group. 102-206 Variable grouping range between 1-8 cells with FX running between the groups. 209-255 Variable interval grouping range for every 2nd to every 8th cells in a group.
Channel 2	Colour Speed 0-255 Variable speed of colour scrolling. From static at 0 to maximum at 255. (Intensity Master when on Mode 7fx + 12 x RGB(A) and Ch5 at Full)	
Channel 3	Colour Fan 0-255 Variable fan of colour between / within groups. All units are the same colour at 0.	
Channel 4	Colour Range 0 Full spectrum 1-255 Variable limit of spectrum for colour scrolling. Single colour at 1, full spectrum at 255.	
Channel 5	Colour Step 0-255 Variable control of smoothness of colour scrolling. Smoothest is at 0. Most coarse is at 250. Rate will vary with scrolling speed. 255 will override effects and switch to RGB. (Mode 7fx + 12 x RGB(A) is activated when this Ch is at Full and Ch2 becomes Master Intensity)	
Channel 6	Intensity Effects 0 Static 1-63 Fade on, fade off. Variable, 63 fastest 64-127 Fade on, snap off. Variable, 127 the fastest 128-191 Snap on, fade off. Variable, 191 fastest 192-255 Snap on, snap off (strobe). Variable, 255 fastest.	
Channel 7	Intensity Fan 0-255 Variable fan of intensity effect between / within groups. All units at the same intensity at 0. Alternating units on & off at 255.	
Channel 8	Hue for group 1	
Channel 9	Saturation for group 1	
Channel 10	Intensity for group 1	
Channel 11	Hue for group 2	
Channel 12	Saturation for group 2	
Channel 13	Intensity for group 2	
	...and so on up to group 12	...and so on up to group 8
Total	**43 DMX channels**	**31 DMX channels**

Color Force DMX Personality Mode 2-3

Color Force V2.1	In modes 2 & 3 each cell is a group.			
	Mode 2		Mode 3 (with Magic Amber)	
	Color Force 72 (36ch) 12 x HSI	Color Force 48 (24ch) 8 x HSI	Color Force 72 (36ch) 12 x RGB	Color Force 48 (24ch) 8 x RGB
Channel 1	Hue for group 1		Red for group 1	
Channel 2	Saturation for group 1		Green for group 1	
Channel 3	Intensity for group 1		Blue for group 1	
Channel 4	Hue for group 2		Red for group 2	
Channel 5	Saturation for group 2		Green for group 2	
Channel 6	Intensity for group 2		Blue for group 2	
Channel 7	Hue for group 3		Red for group 3	
Channel 8	Saturation for group 3		Green for group 3	
Channel 9	Intensity for group 3		Blue for group 3	
Channel 10	Hue for group 4		Red for group 4	
Channel 11	Saturation for group 4		Green for group 4	
Channel 12	Intensity for group 4		Blue for group 4	
Channel 13	Hue for group 5		Red for group 5	
	...and so on up to group 12	...and so on up to group 8	...and so on up to group 12	...and so on up to group 8
Total	**36 DMX channels**	**24 DMX channels**	**36 DMX channels**	**24 DMX channels**

Color Force DMX Personality Mode 4-5.

Color Force V2.1	In modes 4-5 each cell is a group.			
	Mode 4		Mode 5 (with Magic Amber)	
	Color Force 72 (48ch) 12 x RGBA	Color Force 48 (32ch) 8 x RGBA	Color Force 72 (49ch) 1s + 12 x RGBI	Color Force 48 (33ch) 1s + 8 x RGBI
Channel 1	Red for group 1		**Intensity Effects** **0** Static **1-63** Fade on, fade off. Variable, 63 fastest **64-127** Fade on, snap off. Variable, 127 fastest **128-191** Snap on, fade off. Variable, 191 fastest. **192-255** Snap on, snap off (Strobe). Variable, 255 fastest.	
Channel 2	Green for group 1		Red for group 1	
Channel 3	Blue for group 1		Green for group 1	
Channel 4	Amber for group 1		Blue for group 1	
Channel 5	Red for group 2		Intensity for group 1	
Channel 6	Green for group 2		Red for group 2	
Channel 7	Blue for group 2		Green for group 2	
Channel 8	Amber for group 2		Blue for group 2	
Channel 9	Red for group 3		Intensity for group 2	
Channel 10	Green for group 3		Red for group 3	
Channel 11	Blue for group 3		Green for group 3	
Channel 12	Amber for group 3		Blue for group 3	
Channel 13	Red for group 4		Intensity for group 3	
	...and so on up to group 12	...and so on up to group 8	...and so on up to group 12	...and so on up to group 8
Total	**48 DMX channels**	**32 DMX channels**	**49 DMX channels**	**33 DMX channels**

Color Force DMX Personality Mode 6.

Color Force V2.1	In mode 6 all cells are a group (All)
	Mode 6 **Color Force 72 & 48 (9ch)** **6fx + HSI**
Channel 1	**Colour Speed** **0-255** Variable speed of colour scrolling. From static at 0 to maximum at 255. (This channel becomes Intensity Master when on Mode 6fx + 12 x RGB(A) and Ch4 at Full)
Channel 2	**Colour Fan** **0-255** Variable fan of colour between groups. All units are the same colour at 0.
Channel 3	**Colour Range** **0** Full spectrum **1-255** Variable limit of spectrum for colour scrolling. Single colour at 1, full spectrum at 255.
Channel 4	**Colour Step** **0-255** Variable control of smoothness of colour scrolling. Smoothest is at 0. Most coarse is at 250. Rate will vary with scrolling speed. 255 will override effects and switch to RGB. (Mode 6fx + 12 x RGB(A) is activated when this Ch is at Full and Ch1 becomes Master Intensity)
Channel 5	**Intensity Effects** **0** Static **1-63** Fade on, fade off. Variable, 63 fastest **64-127** Fade on, snap off. Variable, 127 fastest **128-191** Snap on, fade off. Variable, 191 fastest. **192-255** Snap on, snap off (strobe). Variable, 255 fastest
Channel 6	**Intensity Fan** 0-255 Variable fan of intensity effect between groups. All units at the same intensity at 0. Alternating units on and off at 255.
Channel 7	Hue
Channel 8	Saturation
Channel 9	Intensity
Total	**9 DMX channels**

Color Force DMX Personality Mode 7-9

Color Force V2.1	In modes 7-9 all cells are a group (All)		
	Mode 7 (3ch) **Color Force 72 & 48** **HSI**	**Mode 8 (3ch)** **Color Force 72 & 48** **RGB** **(with Magic Amber)**	**Mode 9 (4ch)** **Color Force 72 & 48** **RGBA**
Channel 1	Hue	Red	Red
Channel 2	Saturation	Green	Green
Channel 3	Intensity	Blue	Blue
Channel 4			Amber
Total	**3 DMX channels**	**3 DMX channels**	**4 DMX channels**

Color Force DMX Personality Mode 10

Color Force V2.1	In mode 10 all cells are a group (All) Mode 10 (5ch) 1s + RGBI (with Magic Amber)
Channel 1	**Intensity Effects** **0** Static **1-63** Fade on, fade off. Variable range, 63 the fastest **64-127** Fade on, snap off. Variable range, 127 the fastest **128-191** Snap on, fade off. Variable range, 191 the fastest. **192-255** Snap on, snap off (strobe). Variable range, 255 the fastest.
Channel 2	Red
Channel 3	Green
Channel 4	Blue
Channel 5	Intensity
Total	**5 DMX channels**

Color Force DMX Personality Mode 11

Color Force V2.1	Mode 11 (1ch) Look Select
Channel 1	Channel levels and the corresponding Look numbers:

Channel Level (%)	Look	Description
0	OFF	
1–2	1	Full Colour Scroll (5 sec)
3–5	2	Full Colour Scroll (10 sec)
6–9	3	Full Colour Scroll (30 sec)
10–11	4	Warm Colour Scroll (5 sec)
12–15	5	Warm Colour Scroll (10 sec)
16–19	6	Warm Colour Scroll (30 sec)
20–22	7	Cold Colour Scroll (5 sec)
23-25	8	Cold Colour Scroll (10 sec)
26–27	9	Color Colour Scroll (30 sec)
29-32	10	Red Full
33–35	11	Pink Full
36-38	12	Orange Full
39-42	13	Light Orange Full
43-45	14	Yellow Full
46-48	15	Light Yellow Full
49-51	16	Green Full
52-54	17	Light Green Full
56-58	18	Cyan Full
59-61	19	Light Cyan Full
62-64	20	Blue Full
65-68	21	Light Blue Full
69-71	22	3200 White
72-74	23	5600 White
75-78	24	Empty
79-81	25	Empty
83-85	26	Empty
86-88	27	Empty
89-91	28	Empty
92-94	29	Empty
95-97	30	Empty
98-100	31	Empty

2.8 Thermal Performance

The Color Force 48 & 72 fixtures feature 2 internal fans that drive the internal cooling system.

If the internal temperature of the Color Force exceeds 75ºC the output of the fixture is reduced for automatic protection. This happens on rare and extreme conditions when ambient temperature is over 35ºC or the internal fans are blocked or damaged.

The airflow to and from the fan must not be constricted to maintain the maximum operating capacity of the Color Force.

3. Troubleshooting

Troubleshooting is a process of elimination. First, rule out the other field factors (i.e. bad connections, faulty cables and power supplies). For technical support and/or parts, please contact your selling dealer or the offices listed in this manual.

Symptom	Possible Cause	Solution
Fixture does not respond to DMX control.	Set to wrong or different DMX address. Bad cable connecting DMX control and fixture. Bad in/through connection between adjacent fixtures.	Check DMX address and Mode settings. Check/replace DMX run from the console.
Noise from fixture unit.	Fan malfunction.	Check fan.
Low LED output.	Internal temperature is over the limit. Fan is not working.	Check “Fan Control” mode. Check fan. Check for airflow - to and from the internal fan. Check area ventilation.

4. Specification

4.1 Technical specifications

	Color Force 72	Color Force 48
Product Code:	CHCF72NFRGBA	CHCF48NFRGBA
Dimensions:	1759mm x 182mm x 177mm 69.25" x 7.25" x 7"	1181mm x 182mm x 177mm 46.5" x 7.25" x 7"
Weight:	22kg / 48lbs	15kgs / 33lbs
Power input rating:	100-240VAC, 700VA, 50-60Hz	100-240VAC, 400VA, 50-60Hz
Power connector in/out:	PowerCon	
Data connectors in/out:	XLR 5-pin	
Control protocol:	ANSI E1.11 USITT DMX 512-A	
Cooling system:	Forced - 2 fans	
Construction:	Anodised aluminium extrusion	
Colour:	Black	
LED cells:	12	8
LED per cell:	24 (6 x RGBA)	24 (6 x RGBA)
Total LED:	288	192
Optics:	Specialised close focus lens	
Beam angle:	~ 23º (approx)	
Beam distribution:	Asymmetrical direct illumination	
CCT:	Adjustable 1000 – 10000K	
CRI:	92	
Lamp Life:	Up to 25,000 hours	
IP Rating:	IP20	
Operating temperature:	0ºC to 40ºC	
Approvals:	CISPR 22:2006/EN55022:2006 & CISPR 24:1997/EN55024:1998 ICES-003:2004 & FCC Part 15 Subpart B:2007 CSA C22. No. 166-M1983:R2008 UL 1573:2003; UL 8750	

CE

4.2 Illuminance measurements

Color Force 72

Lux and footcandle measurements with RGBA at full intensity:

Throw Distance		Center Beam	Beam Width
3'	LUX	24000	68"
	FC	2230	
6.7'	LUX	10700	69"
	FC	994	
8.75'	LUX	8000	70"
	FC	743	
10'	LUX	6550	71"
	FC	609	
12.5'	LUX	5050	76"
	FC	469	
13.3'	LUX	4580	80"
	FC	425	
15'	LUX	4060	81"
	FC	377	

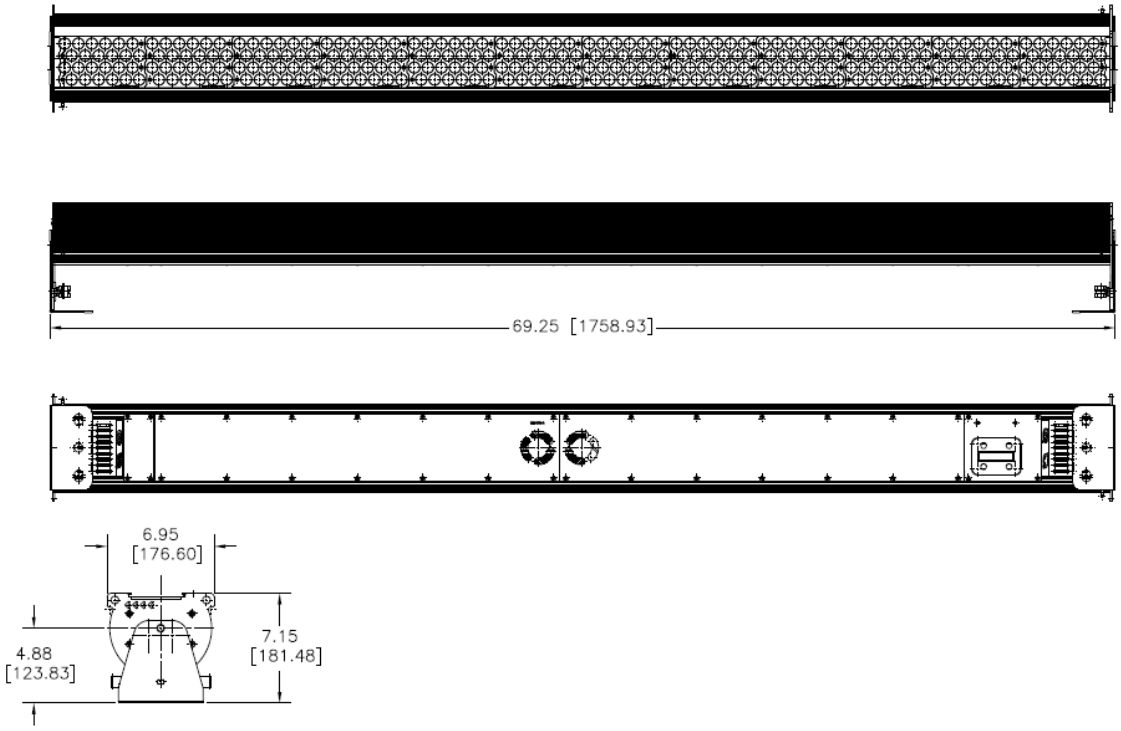
Color Force 48

Lux and footcandle measurements with RGBA at full intensity:

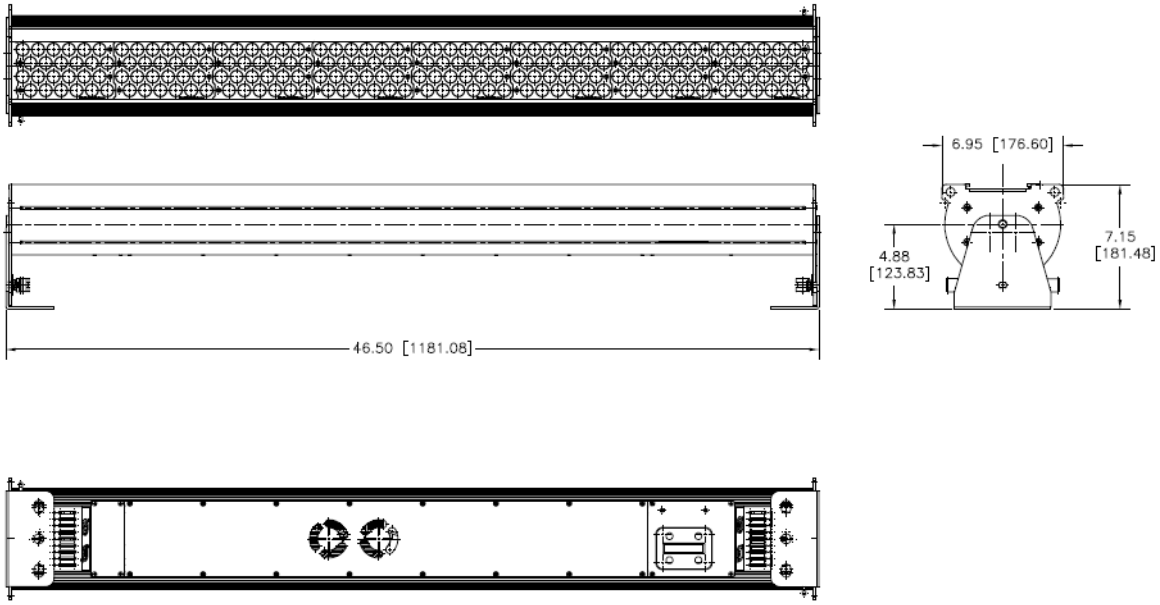
Throw Distance		Centre Beam	Beam Width (in)
3'	LUX	23400	46"
	FC	2174	
6.7'	LUX	10450	48"
	FC	971	
8.75'	LUX	8000	51"
	FC	743	
10'	LUX	6600	54"
	FC	632	
12.5'	LUX	4980	54"
	FC	463	
13.3'	LUX	4600	58"
	FC	427	
15'	LUX	3960	58"
	FC	368	

4.3 Drawings

Color Force 72



Color Force 48



5. Maintenance

With care, the Color Force will require little maintenance. However, as the unit is likely to be used in a stage environment we recommend periodical internal inspection and cleaning of any resulting dust and cracked oil residue.

Do not spray liquids on the front or rear panel. If the front enclosure requires cleaning, wipe with a mild detergent on a damp cloth.